



Childhood Asthma Linkages in Missouri (CALM 2)

2018-2019

Missouri Department of Health and Senior Services



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ABSTRACT

Asthma outcomes from children and adolescents with asthma (N = 71) from 11 school districts participating in the Childhood Asthma Linkages In Missouri 2nd (CALM 2) initiative for the school year 2018 - 2019 were assessed. The 11 schools included Bayless, Grandview, Jennings, Kennett, Mexico, North Kansas City, Neosho, Poplar Bluff, Potosi, Sikeston, and University City. The majority of students (97.2%) received *Teaming Up for Asthma Control*, a work force development intervention to improve asthma control among children by increasing the competency of school nurses and other health professionals to deliver guideline-based education. Most of the students with asthma enrolled in the program completed the recommended three educational sessions (87.1%). Findings indicate improved self-care measures and a significant reduction in six self-reported asthma symptoms and total symptoms.

Project

Childhood Asthma Linkages in Missouri Schools (CALM 2) Evaluation Brief, 2018-2019

Primary Evaluation Question(s)

1. What has been the impact on children enrolled in the CALM 2 initiative?
2. What percentage of enrolled children have regular access to clinical care?
3. Are enrolled children receiving high quality medication management?

For More Information

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THE INITIATIVE

The Childhood Asthma Linkages in Missouri 2nd (CALM 2) initiative is a multicomponent asthma care improvement approach where schools, clinics, public health agencies, and hospitals work together in specific geographic areas. The initiative implements *Teaming Up for Asthma Control* (TUAC), a workforce development intervention to improve asthma control among children by increasing the competency of school nurses and other health professionals to deliver guideline-based education and care.¹ In addition to training and equipment, school nurses are mentored and assisted by regional certified asthma educators in assessing the children with asthma. The goals are to increase asthma control and self-care, promote healthy homes, and reduce impairment. Six school districts implemented the program in the 2017-2018 school year and included Center, Grandview, Mexico, Neosho, Poplar Bluff, and Potosi.² Based on the improved outcomes, the initiative was expanded for the 2018-2019 school year and 11 Missouri school districts participated in the program: Bayless, Grandview, Jennings, Kennett, Mexico, North Kansas City, Neosho, Poplar Bluff, Potosi, Sikeston, and University City.

THE INTERVENTION

In the TUAC program, asthma education for school nurses is provided online in a pretest/posttest format or in instructor-led groups. School nurses who completed training were given TUAC kits with assessment equipment and tools to deliver the program. Students were identified by using a persistent asthma checklist and history review. The intervention components included a standardized assessment, enhancing the student's self-care, and promoting family education and healthy homes.

The standardized assessment includes: (a) airflow using a digital meter that measures forced expiratory volume in one second (FEV1); (b) impairment and environmental tobacco smoke exposure (ETS); (c) inhaler identification, use and use with a spacer; d) inhaler technique before and after coaching, e) and communication of assessment findings to families and clinicians to improve asthma control. Impact Asthma Kids, is a standardized multimedia education program provided as a part of TUAC to the students and their families. Some students also received IGGY and the Inhalers, a cartoon asthma education program or other self-management education. Six symptoms and care indicators were used to assess impairment and control. The six items were summed to determine a total symptom score. The Pearson's chi-squared test or the paired t-test was used to determine statistical significance and alpha was set at < 0.05 .

RESULTS

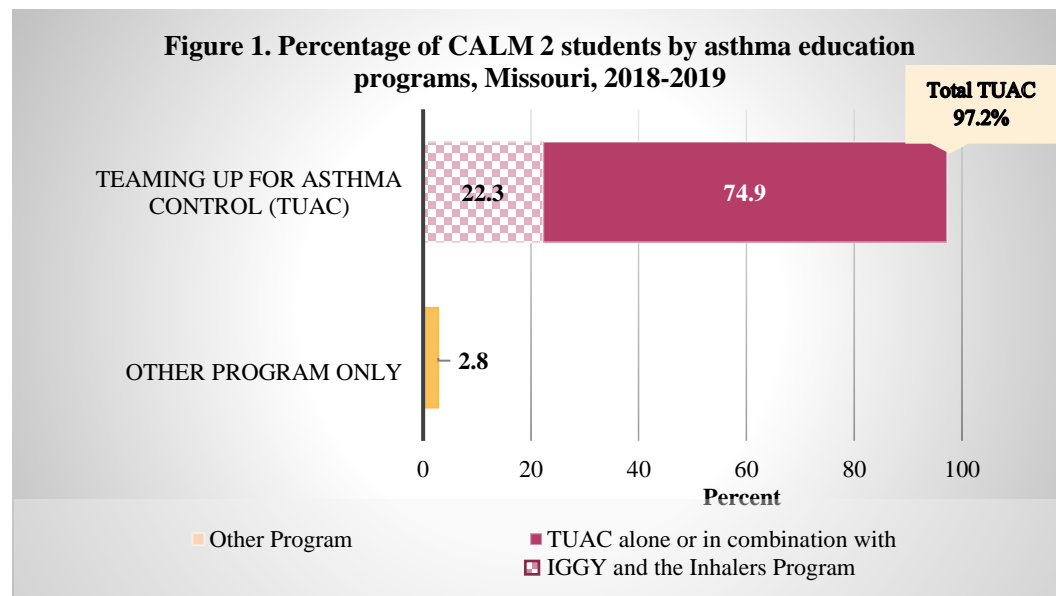
A total of 71 children participated in the program with the majority aged 5 to 11 years (80.3%) and more males (56.3) than females (43.7) (Table 1). A majority (87.1%) completed the recommended three sessions.

Table 1. Characteristics of children participating in the CALM 2 school initiative, Missouri, 2018-2019

<i>Characteristic</i>	<i>Number</i>	<i>Percent</i>
<i>Overall</i>	71	100.0
<i>Age</i>		
5-11	57	80.3
12-17	14	19.7
<i>Gender</i>		
Male	40	56.3
Female	31	43.7
<i>Education Sessions</i>		
1	0	0.0
2	7	10.0
3	61	87.1
> 4	2	2.9
<i>Missing</i>	1	--

-- Excluded from calculation.

The majority of students were enrolled in the TUAC program (97.2%) (Figure 1). About one in five students (22.3%) participated in both the TUAC and *IGGY and the Inhalers*³ education programs. A small group received IGGY or some other program only (2.8%) (Figure 1).



All of the students at the pre-assessment (100%) and the majority at the post-assessment (98.6%) were able to identify their quick relief inhaler (Table 2). The daily or more frequent use of a quick relief inhaler declined from 24.3% to 18.3% (-24.7%) and the consistent use of a spacer with the quick relief inhaler increased from 39.4% to 46.5% (18.3%); however, these were not statistically significant differences.

At the post-assessment, two additional students identified and reported use of an inhaled corticosteroid (ICS) control medication (Table 2). Although the daily use of an ICS control inhaler increased among participating students from 66.7% to 80.5% (20.7%) and the consistent use of a spacer with the ICS inhaler increased slightly from 57.9% to 61.0% (5.4%), these also were not statistically significant differences.



*Daily or more
frequent use of a
quick relief inhaler
declined nearly
25 percent*

Table 2. Inhaler medication identification, frequency and spacer use among students with asthma participating in CALM 2, Missouri, 2018-2019

Quick Relief Inhaler	Response	Pre-Assessment		Post-Assessment		Significance
	N = 71	Number	Percent	Number	Percent ^a	p
Identified	Yes	71	100	70	98.6	--
	No	0	0	1	1.4	
Use	PRN to	40	57.1	49	69.0	.34
	< 3x week					
	3-6x week	13	18.6	9	12.7	
	Daily to	17	24.3	13	18.3	
	several x daily					
Spacer	Missing ^b	1	--	0	--	.67
	Consistently	28	39.4	33	46.5	
	Sometimes	19	28.8	18	25.4	
	Never / Rarely	24	33.8	20	28.2	
ICS/Combo Inhaler ^c						
Identified	Yes	40	56.3	42	59.2	.73
	No	31	43.7	29	40.8	
Use		N = 40		N = 42		.16
	1-2x Daily	26	66.7	33	80.5	
	None	13	33.3	8	19.5	
	Missing ^b	1	--	1		
Spacer	Consistently	22	57.9	25	61.0	.96
	Sometimes	5	13.2	5	12.2	
	Never / Rarely	11	28.9	11	26.9	
	Missing ^b	2	--	1	--	

PRN – as needed; ICS - Inhaled corticosteroid

--Not calculated, too few cases in a cell.

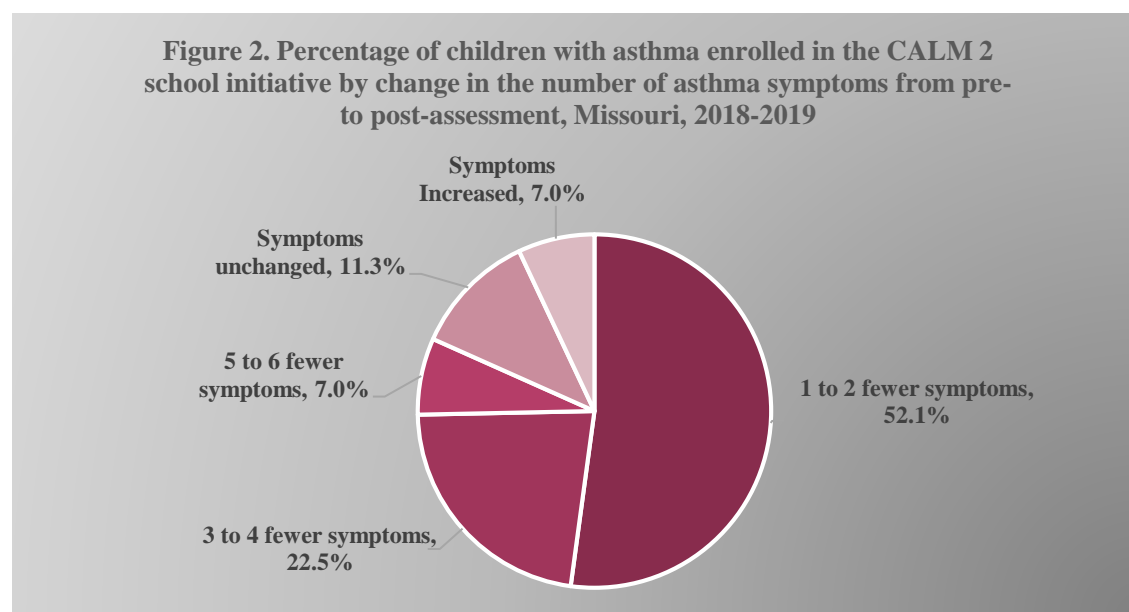
^a May not sum to 100 due to rounding.

^b Missing excluded from calculations.

^c ICS only or combination medication.

Six asthma symptom indicators were assessed and included: coughs or wheezes more than twice per week, sleep interrupted more than a couple times per month, exercise-induced asthma symptoms, missing school because of asthma, asthma attacks requiring urgent treatment, and activity limitation. All six self-reported individual symptoms showed statistically significant improvements from pre- to post-intervention (Table 3). Three out of four children (78.9%) had 0 to 2 symptoms following the intervention (Table 3). In addition, a substantial proportion of the children were symptom-free at the post-intervention (40.8%) compared to the pre-assessment (1.4%).

More than one-half of the children (52.1%) had one to two fewer symptoms from pre-to post-assessment, 22.5% had three to four fewer symptoms, and 7.0% had five to six fewer symptoms (Figure 2). A small proportion of students (7.0%) had an increase in the number of symptoms from pre-to post-intervention and 11.3% had no change in the number of symptoms (Figure 2).



Using the six symptom measures, total symptom scores were compared pre- to post-intervention for the participating students and there was a statistically significant decline in the mean total symptoms ($p < .001$) (Figure 3). Most of the children (> 90%) had health insurance and a primary care provider both pre- and post-intervention.

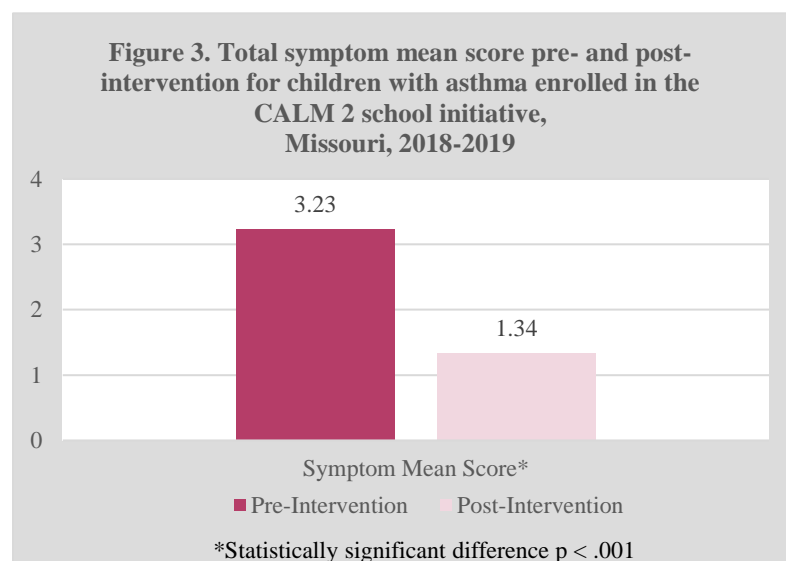


Table 3. Symptom experience and healthcare insurance and primary care providers for children with asthma in the CALM 2 school initiative, Missouri, 2018-2019

Symptom	Response	Pre-Assessment		Post-Assessment		Difference ^a	Significance
		Number	Percent	Number	Percent		
Overall		71	100.0	71	100.0		
Coughs or wheezes > 2x per week	Yes	51	71.8	19	26.8	-45.0	< .001*
	No	20	28.2	52	73.2		
Sleep interrupted > 2x per month	Yes	34	47.9	15	21.1	-26.8	< .001*
	No	37	52.1	56	78.9		
Cough, wheeze, or breathing difficulty during or after exercise	Yes	65	91.5	32	45.1	-46.4	< .001*
	No	6	8.5	39	54.9		
Missing school due to coughing, wheezing or respiratory infections	Yes	29	40.8	12	16.9	-23.9	.002*
	No	42	59.2	59	83.1		
Asthma attacks requiring urgent treatments	Yes	28	40.0	7	9.9	-30.1	< .001*
	No	42	60.0	64	90.1		
	Missing	1	--	0	--		
Asthma has limited activity at school or home in the past week	Yes	22	31.4	10	14.1	-17.3	.014*
	No	48	68.6	61	85.9		
Number of symptoms	0 to 2	21	29.6	56	78.9		< .001*
	3 to 4	36	50.7	12	16.9	-33.8	
	5 to 6	14	19.7	3	4.2	-15.5	
Insurance and Primary Care Provider							
Insurance	Yes	65	91.5	64	90.1	-1.4	.771
	No	6	8.5	7	9.9		
Primary Care Provider	Yes	68	95.8	64	90.1	-5.7	.190
	No	3	4.2	7	9.9		

--Missing excluded from calculations.

^a Difference in percentage points shown for reduced symptoms.

* Statistically significant difference.

DISCUSSION

Improvements in asthma symptoms were the most significant outcomes noted in this evaluation. All of the six symptoms assessed and the total mean symptom scores showed statistically significant improvements. While the use of a quick relief inhaler declined and the daily use of an ICS inhaler and consistent spacer use increased, these were not statistically significant changes. Nevertheless, the overall number of symptoms declined so that the majority of children (78.9%) had 0 to 2 symptoms following the intervention. The large proportion of children receiving inhaled corticosteroid control medication (59.2% post-intervention) indicates many children are receiving quality medication management, although more children maybe would benefit from being prescribed an ICS inhaler medication. The high insurance coverage and having a primary care provider both pre- and post-intervention (>90%) indicated that almost all the children had access to clinical care. This initiative is reaching the goals of increasing asthma control and self-care and reducing impairment. The evaluation has demonstrated that this initiative has contributed substantially to improving asthma outcomes for children with asthma.

COLLABORATORS

This project and evaluation were made possible through a collaboration of the Missouri Asthma Prevention and Control Program staff, Missouri school districts and school nurses, and partners. The following individuals made important contributions:

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² Missouri Department of Health and Senior Services. Childhood Asthma Linkages in Missouri Schools (CALM 2): Enhancing Asthma Outcomes 2018. Jefferson City, MO: Missouri Asthma Prevention and Control Program. <https://health.mo.gov/living/healthcondiseases/chronic/asthma/pdf/childhood-asthma-linkages-in-missouri-report.pdf>

³ Thomas A. IGGY and the Inhalers. <https://iggyandtheinhalers.com/>